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## Targeted delivery of mesenchymal stem cells to the bone.

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### Public Summary:

Osteoporosis is a disease of excess skeletal fragility that results from estrogen loss and aging. Age related bone loss has been attributed to both elevated bone resorption and insufficient bone formation. We developed a hybrid compound, LLP2A-Ale in which LLP2A has high affinity for the  $\alpha_4\beta_1$  integrin on mesenchymal stem cells (MSCs) and alendronate has high affinity for bone. When LLP2A-Ale was injected into mice, the compound directed MSCs to both trabecular and cortical bone surfaces and increased bone mass and bone strength. Additional studies are underway to further characterize this hybrid compound, LLP2A-Ale, and how it can be utilized for the treatment of bone loss resulting from hormone deficiency, aging, and inflammation and to augment bone fracture healing. This article is part of a Special Issue entitled "Stem Cells and Bone".

### Scientific Abstract:

Osteoporosis is a disease of excess skeletal fragility that results from estrogen loss and aging. Age related bone loss has been attributed to both elevated bone resorption and insufficient bone formation. We developed a hybrid compound, LLP2A-Ale in which LLP2A has high affinity for the  $\alpha_4\beta_1$  integrin on mesenchymal stem cells (MSCs) and alendronate has high affinity for bone. When LLP2A-Ale was injected into mice, the compound directed MSCs to both trabecular and cortical bone surfaces and increased bone mass and bone strength. Additional studies are underway to further characterize this hybrid compound, LLP2A-Ale, and how it can be utilized for the treatment of bone loss resulting from hormone deficiency, aging, and inflammation and to augment bone fracture healing. This article is part of a Special Issue entitled "Stem Cells and Bone".

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